

## ***Appendix C***

### ***Biological Opinion and Update***

FHWA & WSDOT, July 2012, *SR 167 Extension ESA Section 7 Formal Update*  
(NMFS Tracking No. 2005/05617, Federal Aid No. BR-0167 (047))

NMFS, February 7, 2013, *Reinitiation of Endangered Species Act Section 7  
Consultation for the State Route 167 Extension Project – Puyallup River Bridge  
Replacement, Pierce County, Washington* (NMFS Tracking No. 2012/03666)

FHWA & WSDOT, July 2012, *SR 167 Extension ESA Section 7 Formal Update*  
(USFWS Reference No. 1-3-05-F-0688, Federal Aid No. BR-0167 (047))

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U.S. Department  
of Transportation

**Federal Highway  
Administration**

Washington Division

Suite 501 Evergreen Plaza  
711 South Capitol Way  
Olympia, Washington 98501-1284  
(360) 753-9480  
(360) 753-9889 (FAX)  
<http://www.fhwa.dot.gov/wadiv>

July 25, 2012  
HFO-WA.4/WA 34

Michael Grady  
National Marine Fisheries Service  
7600 Sand Point Way NE  
Seattle, WA 98115-0070

**SR 167 Extension  
ESA Section 7 Formal Update  
NMFS Tracking No. 2005/05617  
Federal Aid No. BR-0167 (047)**

Dear Mr. Grady:

The Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) would like to reinitiate Section 7 consultation on the SR 167 extension project. The first phase of the project is scheduled for advertisement in 2013, and will include the replacement of the SR 161 Bridge over the Puyallup River.

Recent design work has resulted in project changes that differ from the description in the original biological assessment (BA). In the original BA, the replacement of the northbound 161 bridge would include construction of a temporary traffic detour bridge and a temporary work platform. We are now proposing to move the location of this bridge, which will reduce in-water project effects to listed species. Details are provided in the enclosure. These changes will still result in a may affect, likely to adversely affect determination for Puget Sound Chinook.

Reinitiation on this project is also required to analyze project effects to Puget Sound steelhead and Pacific eulachon, which were not listed at the time of the original consultation. The project **may affect, and is likely to adversely affect** Puget Sound steelhead, and **may affect, and is not likely to adversely affect** Pacific eulachon.

If you have any questions or require additional information, please contact me at 360-534-9344 or by e-mail at [Dean.Moberg@dot.gov](mailto:Dean.Moberg@dot.gov).

Sincerely,

DANIEL M. MATHIS, P.E.  
Division Administrator

By: Dean W. Moberg  
Area Engineer

Enclosure

cc: C. Ward, OR EHS; B. Clarke, OR Project Engineer; M. Carey, HQ ESO

## **SR 167 Extension Project Reinitiation, July 2012**

### **Introduction**

The Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) submitted a biological assessment (BA) for the extension of State Route (SR) 167 on September 27, 2005 to the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). The extension consists of a new six-lane freeway between SR 161 and SR 509 in Pierce County, Washington. Associated project elements included numerous water crossings (including over the Puyallup River), interchanges, and riparian restoration throughout the project area.

The Services requested additional project information after the original BA submittal, which was transmitted to the Services on December 15, 2005. There were several additional information/clarification requests from the Services on stormwater, indirect effects, minimization measures, exposure pathways, and other issues prior to the issuance of the Biological Opinions (BOs). The BA concluded that project impacts would adversely affect Puget Sound Evolutionary Significant Unit (ESU) Chinook salmon, and the Coastal-Puget Sound bull trout DPS. Critical habitat for Puget Sound Chinook was designated September 2, 2005 and for bull trout on September 26, 2005, after the BA was submitted. Subsequent analyses determined that the project would adversely affect critical habitat for Chinook salmon and bull trout.

The USFWS and NMFS BOs were issued on May 31, 2007, and August 20, 2007 respectively (USFWS Ref. No. 1-3-05-F-0688, NMFS Tracking No. 2005/05617). The Services concluded that project actions would not jeopardize the continued existence of these listed species and would not cause adverse modification or destruction of the designated critical habitats in the action area.

FHWA and WSDOT are reinitiating consultation on this project because of changes to the project description and related potential impacts to listed species, and potential impacts to species that have been listed since the issuance of the BOs. These changes were discussed with the Services in a pre-BA meeting on November 17, 2011 at WSDOT Headquarters in Olympia, WA. There has been no construction on the project to date, but the majority of the right-of-way has been purchased.

WSDOT plans on advertising for the first segment of the project in May 2013. This segment will only include work on two SR 161 bridges over the Puyallup River and associated road approaches. In the original project description, the existing two-lane steel bridge would ultimately be replaced with a five-lane structure. In this phase of the work, the deteriorating two-lane steel bridge will only be replaced with a new two-lane bridge, with additional lanes

added at a later date. This work phase will not include changes to work elements in the Hylebos Creek, Surprise Lake Tributary, or Wapato Creek portions of the action area. WSDOT intends to build the project using the design-build process.

### **Changes to Project Description**

There are currently two adjacent SR 161 bridges that cross the Puyallup River within the action area; the northbound structure is a clear-span bridge, has two lanes, is made of steel, and is deteriorating rapidly (dimensions 370' long, with wooden approach structures 100' long on either end, steel truss 22' wide, 40' above ordinary high water {OHM}). The southbound structure is 2 lanes and is made of concrete (dimensions 541' long, 36' wide, and 40' above OHM). In the original project description, the steel bridge would be replaced and the concrete bridge would be widened. To conduct the bridge replacement and widening, two temporary work trestles and one temporary detour bridge were proposed. A barge may also be needed as a work platform for up to two construction seasons.

In the original consultation, the new bridge would be located within the footprint of the existing steel bridge. It was anticipated that building two temporary work trestles and a temporary vehicular detour bridge would take 2 years of construction time, given the proposed 6-week in-water work windows (July 15-August 31). The entire construction period may take several years.

WSDOT is now proposing to put the new bridge 10' downstream of the existing concrete bridge instead of where the existing steel bridge is located. The new bridge would be 541' long, 40' wide, and at least 40' above OHM, and the bridge location, design, and construction method will change. By relocating the new structure, work can be done on the new bridge by staging equipment on the existing concrete bridge. This will reduce the extent of the temporary in-water work trestles that are needed to construct the new bridge (less pile driving), and reduce noise impacts to listed aquatic species. This would also reduce impacts to businesses on the north side of the river. The new bridge will need an in-water pier and a temporary work trestle will be needed for the pier work. The temporary trestle for the pier would be much smaller than the temporary trestle that was originally planned adjacent to the entire length of the steel bridge. Although the specific area and number of piles needed for this temporary trestle are unknown at this stage, it is anticipated that there will be a significant decrease in the over-water trestle area, a decrease in trestle time in-place in the Puyallup River, and a decrease in the number of piles needed for the pier trestle compared to the original plan. The approximate dimensions of the temporary trestle are 30' wide by 100' long, as opposed to a 30' wide trestle the full 300' width of the river. Due to the configuration of the proposed new bridge, the need for a detour bridge has been eliminated.

Work that will be done on the concrete bridge includes removing the existing sidewalk and upgrading the traffic barrier on either side of the bridge deck. No work will be done on the piers of this bridge in this phase of work.

The project will be built with the design/build process, and WSDOT would specify the location of bridge piers, bridge length/width, and touch-down points. Constructability issues would be left to the contractor within the constraints of the consultation.

An additional issue emerged after the project Environmental Assessment (EA) was completed. The existing steel bridge was not considered a historic structure in that analysis. A Section 106 analysis was recently conducted, and the State Historic Preservation Office (SHPO) determined that the steel truss bridge is historic. This bridge will remain in place until a suitable location is found for it (it cannot remain in-place for the full bridge build-out). During that interim period it would be closed to traffic and pedestrians and would not be considered a pollution generating impervious surface. Eventual bridge removal would follow the procedures outlined in the original BA.

Another question was raised in the pre-BA meeting regarding the original stormwater analysis for the SR 161 bridge area. The question was asked if the stormwater analysis had been updated for the bridge area. Potential effects from stormwater were originally analyzed using a precursor to the currently used Hi-Run model. The original analysis was conducted for the Puyallup River drainage basin, and the bridge area was a small part of the larger basin.

Additional design work on stormwater best management practices (BMPs) is in progress, and staff will be conducting a stormwater analysis as plans develop. Preliminary plans show placement of a bioinfiltration swale within the northwest bridge quadrant; this was not in the original BA plans. The two bridge outfalls will also be relocated, with no additional outfalls being constructed. Final plans will be developed by the design-build contractor, and will meet or exceed the design standards specified in the BOs, including the use of enhanced BMPs for this area. WSDOT staff will conduct an updated stormwater analysis once these plans are available.

Changes to the project description are summarized in Table 1.

**Table 1. Comparison of Original and Revised Project Description Elements at the Puyallup River, SR 167, Pierce County, WA**

<b>Work Element</b>	<b>Original BA 2005</b>	<b>Revised BA 2012</b>
New bridge location	Replace bridge within footprint of existing steel structure	Replace bridge 10' downstream of concrete bridge
New bridge construction	Maximum of 2 in-water piers, drilled shafts	1 in-water pier, drilled shafts
Existing steel bridge historical status	Not historic	Recent SHPO concurrence that steel truss bridge is historic
Existing concrete bridge work	Widen bridge from 33 to 43 feet	No widening in this phase but remove sidewalk and upgrade traffic barriers
SR 161/167 intersection	Change to full interchange	No change
Temporary structures within OHWM	3 structures: 1 trestle for work on steel bridge (maximum of 100 piles), 1 trestle for work on concrete bridge (maximum 100 piles), 1 detour bridge (maximum 100 piles)	Final design based on design build contractor, but 1 temporary trestle for steel bridge pier reduced in area and duration in-water from initial plan, and temporary detour bridge eliminated. Potential reduction of estimated 100-150 in-water piles.
Pollution generating impervious surface	About 70 acres in Puyallup basin	Unchanged
Stormwater treatment	Impacts assessed at basin level. Basic and enhanced treatment to meet performance standards for total and dissolved copper, total and dissolved zinc, suspended sediment	Bioinfiltration swale proposed for NW quadrant of bridge. Stormwater analysis will be conducted once final plans are available.

## **Potential New Effects to Species From Changes in the Project Description and Effects on Recently Listed Species**

### **Potential Effects to Listed Species from Changes in the Project Description**

In the original consultation and subsequent updates, Puget Sound Chinook salmon was found to be adversely affected by proposed project actions, as well as Chinook critical habitat.

### **New Project Effects on Listed Species**

The original BA described effects to Puget Sound Chinook salmon. Chinook are found within the action area in the Puyallup River and Hylebos Creek. The project changes described here only affect the Puyallup River.

Effects to those species were originally described as follows:

- Increased sedimentation and turbidity up to 300 feet downstream of in-water work;
- Potential indirect effects up to 0.25 mile from interchanges;
- Shading from temporary and permanent in-water structures;
- Underwater noise from pile driving up to 0.6 mile upstream and downstream;
- Stormwater discharges to the Puyallup River after treatment; and
- Dewatering and fish handling.

The revised project will still have the same effects, but some of the effects (underwater noise, turbidity, shading) will be reduced in magnitude for the Puyallup River portion of the action area. Although the specific construction methods will not be known until final plans are available from the design-build contractor, it is anticipated that the number of piles for temporary structures in the Puyallup River may be reduced by  $\frac{1}{3}$  to  $\frac{1}{2}$  from the original estimate of 300 piles. This will lead to reduced sound exposure levels for listed and Chinook salmon, fewer days with in-water pile driving and less associated turbidity, less shaded area in the river, a smaller area of impact to benthic prey organisms, and a reduced in-river area for temporary structures that may affect salmonid migration.



## Recently Listed Species

There are two species that have been listed since the BOs were issued in 2007. The Puget Sound steelhead distinct population segment (DPS) was listed as threatened on 5/11/07, and the Southern Pacific eulachon DPS was listed on 3/18/10 as threatened. Critical habitat has not been proposed or designated for Puget Sound steelhead, and critical habitat was designated for eulachon on 10/20/11.

### Puget Sound Steelhead

Juvenile and adult steelhead are documented in the Blair and Hylebos Waterways, the Puyallup River, and Hylebos Creek, all within the project action area. Juvenile steelhead have occasionally been observed in upper Wapato Creek tributaries, including Simons Creek, but steelhead have not been documented in Surprise Lake Tributary. The Washington Department of Fish and Wildlife (WDFW) recognizes three Puyallup River steelhead stocks: main stem Puyallup winter, White River winter, and Carbon River winter. Adult migration and spawning in the Puyallup River typically occurs from January through June. Data from the Mud Mountain Dam trap on the White River indicate that there is still a small population of summer run steelhead that run from June to October. The vast majority of outmigrant smolts exit the river system by the end of June (Berger and Williamson 2005), and are not thought to rear in the project action area because of degraded habitat conditions on the lower Puyallup River and in Hylebos Creek. It is possible that adult and juvenile steelhead may be in the action area from January through October.

### Pacific Eulachon

Eulachon are rare in Puget Sound, and many previous records have now been discredited as misidentification of surf smelt and longfin smelt. Adult eulachon return to freshwater rivers (primarily the Columbia River and tributaries) to spawn from December to May in Washington. There are no known spawning rivers in Puget Sound, but adult eulachon strays have been recorded in several areas. The Lincoln Avenue wetland is connected to the Puyallup River just downstream of the action area, and was monitored for fish species presence from 1986-1989. Eulachon were found in fyke net samples at the mouth of the wetland in 1987 and 1988 (Thom et al. 1990), but spawning in the Puyallup River is not documented or expected.

There is no designated eulachon critical habitat within the project action area.

## Determination of Effect

### Puget Sound Chinook Salmon

The original determination indicated that the proposed project **may affect, and is likely to adversely affect** Puget Sound Chinook. This determination was based on:

- pier placement may occur in potentially suitable spawning habitat;
- juvenile Chinook salmon potentially occur in the Puyallup River throughout the year and fish handling may be necessary;
- in-water work (pile driving and potential dewatering) is proposed in the Puyallup River and Hylebos Creek, which may result in harm and behavioral disruption to the species.

The revised project with construction of a new SR 161 bridge over the Puyallup River **may affect, and is likely to adversely affect** Puget Sound Chinook, but the effects of underwater noise, turbidity, and shading from temporary in-water structures are expected to be diminished from original estimates because fewer and smaller in-water structures are anticipated.

### Puget Sound Chinook Critical Habitat

The original determination indicated that the proposed project **may affect, and is likely to adversely affect** Puget Sound Chinook critical habitat. This determination was based on:

- delayed migration of adult and juvenile Chinook salmon because of replacement and widening of the bridges over the Puyallup River over an estimated 27 month period.

This phase of the project **may affect, and is likely to adversely affect** Puget Sound Chinook critical habitat. Salmon migration will continue to be delayed in this phase of the project, although the size and residence time of temporary in-water structures that may affect migration is expected to be reduced.

## Puget Sound Steelhead

The proposed project **may affect, and is likely to adversely affect** Puget Sound steelhead. This determination is based on:

- juvenile and adult steelhead potentially occur in the Puyallup River and juvenile steelhead occur in Blair/Hylebos Waterways and Hylebos Creek, and fish handling will be conducted in these areas;
- elevated turbidity can be expected from various activities in the Hylebos and Puyallup basins including Hylebos Creek channel relocation, grading and filling in both basins, and riparian vegetation restoration activities. Although steelhead exposure to periods of elevated turbidity are expected to be brief because use is restricted to migration, feeding and migration timing may be affected; and
- in-water work (pile driving and potential dewatering) is proposed in the Puyallup River and Hylebos Creek, which may result in harm and behavioral disruption to the species.

## Pacific Eulachon

The proposed project **may affect, but is not likely to adversely affect** Pacific eulachon based on:

- eulachon presence in the action area is based on two records from a nearby site on the Puyallup River, and regular eulachon use of the Puyallup River and other waterbodies in the action area is discountable; and
- The proposed in-water work window of July 15-August 31 does not overlap with the known spawning period for eulachon in Washington State freshwater rivers.

There will be **no effect** on eulachon critical habitat, which is not found in the project action area.

There are no additional project updates at this time, but we will keep the Services informed as developments arise.

## References

Berger, A. and K. Williamson. 2005. Puyallup River Juvenile Salmonid Production Assessment Project 2004. Puyallup Tribal Fisheries Department. Puyallup, WA.

Thom, R.M., C.A. Simenstad, J. R. Cordell, D.K. Shreffler, and L. Hamilton. 1990. The Lincoln Avenue Wetland System in the Puyallup River Estuary, Washington. Wetland Ecosystem Team, Fisheries Research Institute. Annual Report to City of Tacoma.



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Northwest Region  
7600 Sand Point Way N.E., Bldg. 1  
Seattle, Washington 98115

NMFS Tracking No.:  
2012/03666

February 7, 2013

Daniel M Mathis  
Federal Highway Administration  
Suite 501, Evergreen Plaza  
711 South Capitol Way  
Olympia, Washington 98501-1284

Re: Reinitiation of Endangered Species Act Section 7 Consultation for the State Route 167 Extension Project – Puyallup River Bridge Replacement. Pierce County, Washington.  
(Hydraulic Unit Code 171100140599, Lower Puyallup River)

Dear Mr. Mathis:

The National Marine Fisheries Service (NMFS) reviewed your August 29, 2012 request to reinitiate consultation for Chinook salmon and Chinook salmon critical habitat and initiate formal consultation on steelhead for the State Route (SR) 167 Extension Project in Pierce County, Washington. On September 21, 2007, the NMFS completed the formal consultation on this project and issued a Biological Opinion (Opinion) (NMFS Tracking Number 2005/05617). The Opinion concluded that the proposed action would not jeopardize the continued existence of the Puget Sound (PS) Chinook salmon (*Oncorhynchus tshawytscha*) Evolutionarily Significant Unit (ESU) and is not likely to destroy or adversely modify PS Chinook critical habitat.

The August 29, 2012 letter from the Federal Highway Administrations (FHWA) was supplemented by additional information from the Washington State Department of Transportation (WSDOT) during a site visit on September 4, 2012 followed by a series of discussions and electronic correspondences until November 14, 2012. The subsequent meetings and information exchanges resulted in a refined description of changes to the original design to replace the SR 167 Puyallup River Bridge. The FHWA determined that changes to the bridge design would lessen the potential impacts on PS Chinook and PS Chinook designated critical; therefore, incidental take would not exceed the original Opinion. The NMFS agrees with this effect determination and therefore, no additional discussion on PS Chinook or PS Chinook critical habitat will be conducted in this document.

Furthermore, your letter also included a request for consultation on the PS steelhead (*O. mykiss*) Distinct Population Segment (DPS) and the Pacific eulachon (*Thaleichthys pacificus*) southern DPS. Eulachon were not listed when the Opinion was produced. The FHWA determined that the original project and this revised design would not adversely affect eulachon because they



occur very infrequently in the lower Puyallup River and none have been documented in the project action area. Thus, the effects of the project on eulachon would be discountable. The NMFS agrees with this effect determination and this species will not be discussed further in this document.

In contrast, the FHWA determined that the proposed project is likely to adversely affect PS steelhead. The NMFS agrees with this determination and initiated formal consultation on November 21, 2012.

This proposed action is funded in part by the FHWA, permitted by the U.S. Army Corp of Engineers, and is being carried out by WSDOT.

### **Changes to the Proposed Action**

#### **SR 167 Puyallup River Bridge**

In the original consultation, the new bridge would be located on the upstream side of the existing concrete bridge but within the footprint of the existing steel bridge. It was anticipated that building two temporary work trestles and a temporary vehicular detour bridge would take two years of construction time, given the proposed 6-week in-water work windows (July 15-August 31).

The WSDOT is now proposing to construct the new bridge ten feet downstream of the existing concrete bridge instead of where the existing steel bridge is located. The new bridge will be 541 feet long, 40 feet wide, and at least 40 feet above the Ordinary High Water Mark (OHWM). With the new alignment, the new bridge can be constructed by staging equipment on the existing concrete bridge and while maintaining two-way traffic on the steel bridge. This will reduce the duration and footprint of the temporary in-water work trestles needed to construct the new bridge. The new bridge will be supported by only one in-water pier; the original design included two piers. A temporary work trestle will still be used to construct the pier but the structure will occupy a smaller portion of the left bank instead of spanning the entire width of the river. The approximate dimensions of the temporary trestle will be 30 feet wide by 100 feet long, as opposed to a 30 feet wide trestle that spanned the full 300-foot width of the river. The number of support piles is decreased from 150 piles to 60 piles. Due to the configuration of the proposed new bridge, the need for a detour bridge has been eliminated. Overall, there is no change to the 70 acres of new impervious surfaces that was originally proposed.

After the new bridge is completed and open to traffic, the deck of the existing steel truss bridge will be removed in pieces. Best Management Practices (BMPs), such as drop tarps, will be installed to prevent all loose material and slurry from entering the Puyallup River. Large cranes on either end will lift the entire bridge frame off as one unit so it may be stored away from the river until the cities of Buckley and Enumclaw and King and Pierce counties pool their funds to reuse the bridge for pedestrian paths.

Table 1. Comparison of Original and Revised Project Description Elements at the Puyallup River, SR 167, Pierce County, WA.

<b>Work Element</b>	<b>Original biological assessment (BA) 2005</b>	<b>Revised BA 2012</b>
New bridge location	Replace bridge within footprint of existing steel structure	Replace bridge 10 feet downstream of concrete bridge
New bridge construction	Maximum of 2 in-water piers, drilled shafts	One in-water pier, drilled shafts
Existing steel bridge historical status	Not historic	Recent SHPO concurrence that steel truss bridge is historic. The bridge, associated support structures, and approaches will be removed.
Existing concrete bridge work	Widen bridge from 33 to 43 feet	No widening in this phase but will remove sidewalk and upgrade traffic barriers
SR 161/167 intersection	Change to full interchange	No change
Temporary structures within OHWM	3 structures: 1 trestle for work on steel bridge, 1 trestle for work on concrete bridge, and 1 detour bridge (maximum 150 piles)	One, 30ft x 100ft temporary trestle reduced in area and duration in-water from initial plan, and temporary detour bridge eliminated. The number of support piles has been reduced to 60, 24-inch hollow steel piles.
Pollution generating impervious surface	About 70 acres in Puyallup basin. Total of 204 acres.	Unchanged
Stormwater treatment	Impacts assessed at basin level. Basic and enhanced treatment to meet performance standards for total and dissolved copper, total and dissolved zinc, suspended sediment	Bioinfiltration swale proposed for NW quadrant of bridge. Stormwater analysis will be conducted once final plans are available.
In-water work window	July 15 – August 31	Unchanged

## *Stormwater Design*

The new bridge location will require relocating two stormwater outfalls. Because of the dearth of stormwater treatment design information, the NMFS requires that all stormwater will be infiltrated. If soil conditions do not allow adequate infiltration, then stormwater shall be treated using the most advanced and approved design for enhanced treatment and detention before the stormwater is allowed to enter the White River or its tributaries. The FHWA/WSDOT will provide the NMFS with their proposed stormwater treatment, Hi-RUN analysis and designs for review and approval no later than 90 days before construction begins.

### **Action Area of Bridge Design Change**

Changing the location and size of the temporary work trestle significantly reduces the action area that is defined by underwater noise from pile driving. The original underwater noise action area extended 1,850 feet upstream and 4,200 feet downstream until the bends in the river terminated the noise. The new trestle location along the left bank and the smaller size reduces the straight line angle of underwater noise transmission to 1,500 feet upstream and 2,300 feet downstream.

At the completion of full build-out with the updated design, the footprint of the permanent structures will result in the reduction of the affected area by only using one pier to support the new bridge instead of two. The construction disturbance is estimated to be the same area and duration except for a smaller footprint of the temporary work trestle. The number of work trestle piles is expected to be reduced, thereby resulting in a shorter period of turbidity and underwater noise; however, turbid plumes may still reach 300 feet downstream of the project. There will be a temporal increase in shading while the trestle is in place and until the existing steel bridge is removed.

For this reinitiation, the effects analysis focuses specifically on the difference between the effects previously considered and those resulting from the reported changes to the proposed action presently under consideration. Changes to the SR 167 Puyallup River Bridge portion of the project are expected to have an overall reduction on the impacts to PS Chinook salmon from those considered in the original Opinion; thus, no additional impacts from these changes are expected beyond those already considered in the original consultation.

### **Steelhead Consultation**

The FHWA and WSDOT requested to initiate formal consultation on the PS steelhead DPS. This species was listed shortly before the completion of the original consultation; however, due to the early design phase it was determined to hold off on consulting on this species until more design details were known. The change to the SR 167 bridge design are now provided; however, the remaining design aspects of the larger project as known during the original consultation still stand as the preferred design. Thus, with the exception of the changes to the SR 167 Bridge, all design and impact information provided in the original BA and biological opinion (BO) that were applicable to PS Chinook salmon are equally applicable to PS steelhead. The extent of upland and stream impacts are described in greater detail and technically supported in the original consultation and are incorporated by reference for this consultation (NMFS 2007).



## Status of Listed Species

### *Puget Sound Steelhead*

The PS steelhead DPS was listed as threatened in May 2007. In November 2011, the NMFS conducted a five-year review and concluded that the status of the listed Puget Sound Steelhead DPS has not changed substantially since the 2007 listing, and that the species should remain listed as threatened (Ford et al. 2011).

As part of the recovery planning process, NMFS convened a technical recovery team to identify historic populations and develop viability criteria for the recovery plan. On November 4, 2011, the NMFS released the technical recovery team draft report describing the historical population structure of Puget Sound steelhead for review. On August 2, 2012, the NMFS released a revised technical team draft report describing historical population structure based on public comment. In addition, the NMFS released the technical recovery team draft report describing viability criteria for Puget Sound steelhead for review. The report on viability criteria will be completed in the spring of 2013.

Steelhead are the anadromous form of *O. mykiss*. PS steelhead typically spend two to three years in freshwater before migrating downstream into marine waters. Once the juveniles emigrate, they move rapidly through Puget Sound into the North Pacific Ocean where they reside for several years before returning to spawn in their natal streams. Unlike other species of *Oncorhynchus*, *O. mykiss* are capable of repeated spawning. Averaged across all West Coast steelhead populations, eight percent of spawning adults have spawned previously. Coastal populations have a higher incidence of repeated spawning than inland populations (Busby et al. 1996). There are two types of steelhead, winter steelhead and summer steelhead. Winter steelhead sexually mature during their ocean phase and spawn soon after arriving at their spawning grounds. Adult summer steelhead enter their natal streams and spend several months holding and maturing in freshwater before spawning.

***Spatial Structure and Diversity.*** Steelhead are located in the majority of accessible larger tributaries in Puget Sound, Hood Canal, and the eastern Strait of Juan de Fuca. Over 50 historical steelhead stocks have been identified in Puget Sound by the Washington Department of Fish and Wildlife (WDFW). The definition of individual populations of steelhead within the DPS is being developed by the PS Steelhead Technical Recovery Team (NMFS 2011). The PS steelhead BRT determined that lack of spatial structure posed moderate risk to the viability of the DPS due to reduced complexity and diminishing connectivity among populations (Hard et al. 2007). Large numbers of barriers, such as impassable culverts, together with declines in natural abundance, greatly reduce opportunities for adfluvial movement and migrations between steelhead groups within watersheds.

The PS steelhead BRT concluded that the viability of PS steelhead is at moderate risk due to the reduced life history diversity of stocks and the potential threats posed by artificial propagation and harvest in the Puget Sound (Hard et al. 2007). The winter-run steelhead is the predominant run in Puget Sound, in part because there are relatively few basins in the Puget Sound DPS with

the flow and watershed characteristics necessary to establish the summer-run life history (NMFS 2011). All summer-run stocks are depressed and concentrated in northern Puget Sound. Production of hatchery stocks that are either out-of-DPS-derived stocks (Skamania River summer run) or within-DPS stocks that are substantially diverged from local populations (Chambers Creek winter run) largely outnumber naturally-produced steelhead in many basins throughout Puget Sound.

***Abundance and Productivity.*** The PS steelhead DPS is composed primarily of winter-run populations. No abundance estimates exist for most of the summer-run populations; all appear to be small, most averaging less than 200 spawners annually. Summer-run populations are concentrated in northern and central Puget Sound and Hood Canal. Steelhead are most abundant in northern Puget Sound, with winter-run steelhead in the Skagit and Snohomish rivers supporting the two largest populations (approximately 3,000 and 5,000 respectively). Most populations have declined in the last five years. Widespread declines in abundance and productivity in most natural populations have been caused by the following factors:

- (1) Steelhead habitat has been dramatically affected by dams in the Puget Sound Basin that eliminated access to habitat or degraded habitat by changing river hydrology, temperature profiles, downstream gravel recruitment, and movement of large woody debris.
- (2) In the lower reaches of rivers and their tributaries, urban development has converted natural areas (e.g. forests, wetlands, and riparian habitat) into impervious surfaces (buildings, roads, parking lots, etc.). This has changed the hydrology of urban streams causing increases in flood frequency, peak flow, and stormwater pollutants. The hydrologic changes have resulted in gravel scour, bank erosion, sediment deposition during storm events, and reduced summer flows (Moscrip and Montgomery 1997; Booth et al. 2002; May et al. 2003).
- (3) Agricultural development has reduced river braiding, sinuosity, and side channels through the construction of dikes and the hardening of banks with riprap. Constriction of rivers, especially during high flow events, increases gravel scour and the dislocation of rearing juveniles. Much of the habitat that existed before European immigration has been lost due to these land use changes (Beechie et al. 2001; Collins and Montgomery 2002; Pess et al. 2002).
- (4) In the mid-1990's, WDFW banned commercial harvest of wild steelhead. Previous harvest management practices contributed to the decline of PS steelhead (Busby et al. 1996). Predation by marine mammals (mainly seals and sea lions) and birds may be of concern in some local areas experiencing dwindling steelhead run sizes (Kerwin 2001).
- (5) Ocean and climate conditions can have profound impacts on steelhead populations. Changing weather patterns affect their natal streams. As snow pack decreases, in-stream flow is expected to decline during summer and early fall (Battin et al. 2007).
- (6) The extensive propagation of the Chambers Creek winter steelhead and the Skamania Hatchery summer steelhead stocks have contributed to the observed decline in abundance of native PS steelhead populations (Hard et al. 2007). Approximately 95 percent of the hatchery production in the PS DPS originates from these two stocks. The Chambers Creek stock has

undergone extensive breeding to provide earlier and more uniform spawn timing. This has resulted in a large degree of reproductive divergence between hatchery and wild winter-run fish. The Skamania Hatchery stock is derived from summer steelhead in the Washougal and Klickitat rivers and is genetically distinct from the Puget Sound populations of steelhead. For these reasons, Hard et al. (2007) concluded that all hatchery summer- and winter-run steelhead populations in Puget Sound derived from the Chambers Creek and Skamania Hatchery stocks should be excluded from the DPS. NMFS included two hatchery populations that were derived from native steelhead, the Green River winter-run and the Hamma Hamma winter-run, as part of the DPS (72 FR 26722, May 11, 2007).

***Affected Populations of Puyallup/White River Puget Sound Steelhead.*** Information from the updated status review, Ford et al (2011)<sup>1</sup> indicates a widespread declining trend over much of the DPS, with data showing relatively low abundance (4 of 15 populations with fewer than 500 spawners annually) and declining trends (6 of 16 populations) in natural escapement of winter-run steelhead throughout Puget Sound, particularly in southern Puget Sound and on the Olympic Peninsula.

The WDFW recognizes three Puyallup River steelhead stocks: mainstem Puyallup winter, White River winter, and Carbon River winter. Adult migration and spawning in the Puyallup River typically occurs from January through June. Data from the Mud Mountain Dam trap on the White River and test fisheries on the lower Puyallup River document an occasional individual adult steelhead appearing at other months of the year, but only winter-run populations are recognized by WDFW. These other steelhead are likely summer-run strays from the Green and Skykomish rivers.

Both the Puyallup and White River populations of winter-run steelhead pass through the action area to spawn upstream. The juveniles out-migrate on their way to Puget Sound and the Pacific Ocean. Both populations have declined steadily since the 1980's with a precipitous decline seen at the White River trap- and- haul facility beginning in 2003 when only 163 adult steelhead were passed above Mud Mountain Dam. Data from 2005 to 2009 indicate that geometric means of natural spawners for Puyallup River winter-run and White River winter-run steelhead were 326 and 265, respectively. Redd surveys in the Puyallup River drainage during the same time appear to have similar dismal results (Puyallup Tribe 2011<sup>2</sup>). Recently, the steelhead populations have shown a slight increase, starting in 2010 with an average of 534 on the White River through the 2012 season.

In addition to the Puyallup River, juvenile and adult steelhead are also documented in the Blair and Hylebos Waterways, and Hylebos and Wapato creeks. All are within the project action area. No steelhead have been documented in the Surprise Lake Drain, which is located within the project footprint.

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<sup>1</sup> Ford M.J. (ed.). 2011. Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest. U.S. Dept. Commer., NOAA Tech. Memo. NMFS- WFSC-113, 281 p.

<sup>2</sup> Puyallup Tribal Fisheries. 2011. 2010-2011 Annual Salmon, Steelhead, and Bull Trout Report. WRIA 10: Puyallup/White River Watershed.

## Effects of the Proposed Action

The Puyallup Tribe (2012)<sup>3</sup> operates a smolt trap on the Puyallup River at river mile (RM) 10.7, just upstream of the confluence with the White River. The trap is approximately 2.4 RMs upstream from the project site. According to the most recent report, juvenile steelhead were captured from February 20, 2011 until June 19<sup>th</sup>, 2011 with nearly all captures occurring during late April to mid-June. The smolt captures characterize out-migration timing, indicating that in-water work occurring in the lower Puyallup and lower portions of tributaries from mid-July to the end of August are least likely to encounter steelhead.

Species	Life Cycle	In-Water Work Window											
		Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Steelhead (winter)	Adult return Puyallup R.												
	Juvenile migration												

1 = Natural origin, 2 = Hatchery origin

Additional in-water work will occur in the Blair Waterway and Hylebos Creek where juvenile and adult steelhead may occur. Adult steelhead are expected to avoid entrapment; however, juveniles may be caught within work site enclosures and dewatered sections of streams requiring removal with dip nets and electrofishing following the WSDOT (2009) fish exclusion protocol.

Handling stresses fish, increasing plasma levels of cortisol and glucose (Hemre and Kroghdahl 1996; Frisch and Anderson 2000). Electrofishing can kill fish or cause physical injuries including internal hemorrhaging, spinal misalignment, or fractured vertebrae. Although potentially harmful to fish, electrofishing is intended to locate fish in the isolated work area for removal to avoid more certain injury. Ninety-five percent of fish captured and handled survive with no long-term effects, and up to five percent are expected to be injured or killed, including delayed mortality because of injury (NMFS 2003).

While the reduced footprint of the new bridge and construction techniques will greatly lessen the risk of encountering Chinook salmon as originally described, juvenile steelhead may occur in the project footprint at any time of year. The NMFS expects a small number of steelhead juveniles to be present during the in-water work window of July 15-August 31.

### *In-stream Habitat*

Hylebos Subbasin - For up to three years, Hylebos Creek in the vicinity of the SR 167 and I-5 interchange will be diverted into a temporary diversion channel, located between SR 99 and I-5. Physical habitat conditions within the diversion channel that juvenile and adult winter-run PS steelhead will be exposed to will likely be no worse than those in the existing stream channel,

<sup>3</sup> Puyallup Tribe of Indians. 2012. Authors: Andrew Berger, Robert Conrad, Justin Paul. Puyallup River Juvenile Salmonid Production Assessment Project 2011.

and may in fact be improved with the inclusion of large woody debris (LWD) as cover for rearing juvenile steelhead. However, the streambed of the temporary diversion probably will not stabilize during the three-year duration of the diversion and may produce excessive levels of turbidity within the 100-foot mixing zone. In addition, initially and for some period of time after construction of the temporary diversion channel, in-stream habitat will not likely support the production of invertebrate prey organisms for juvenile salmonids. However, drift of invertebrates from upstream reaches of Hylebos Creek is expected to colonize the diversion channel before the emergence of steelhead fry the following winter (Barton 1977; Chisholm and Downs 1978; Waters 1995).

The temporary diversion channel will be constructed within or immediately adjacent to the footprint of the former USG Industrial Waste site. Excavation of the diversion channel, to the same depth and gradient as the existing adjacent Hylebos Creek channel, may expose arsenic-contaminated soils and groundwater beneath the waste site. However, following construction of the Hylebos riparian restoration proposal (RRP) and the permanent relocation of Hylebos Creek, the temporary diversion channel will be abandoned and filled. For up to three years, PS steelhead, particularly rearing or migrating juveniles, will likely be exposed to extremely high soil concentrations (up to 1,400 mg/kg) and groundwater concentrations (up to 30,000 µg/L) of arsenic. Juvenile steelhead in the diversion may have additional arsenic exposure via the food web because arsenic may impact salmonid prey due to growth inhibition of algae measured at lower arsenic concentrations than are toxic to fish (Beckvar, NOS, pers. comm. 2006). Juvenile steelhead rearing in the diversion may experience additional exposure to arsenic when they reach the Hylebos Waterway, where concentrations in water and sediment are still elevated. The effect of this additional exposure is unknown. The presence of other metals in water, sediment and the food web; particularly dissolved copper and zinc from stormwater, could act additively with the arsenic to cause adverse effects at lower arsenic concentrations.

Physical habitat conditions, particularly for rearing juvenile winter-run PS steelhead, provided within the newly created 4,000-foot long by 20-foot wide Hylebos Creek channel and 5,300-foot long by 4-foot wide Surprise Lake Drain stream channels will be improved over existing, degraded in-stream and riparian conditions. Over the long-term, in-stream temperatures and sediment input should decrease; the amount of LWD, pool frequency, water quality, off-channel habitat, streambank conditions, floodplain connectivity, flow regimes and riparian reserves should all improve.

Natural stream channel stability will be achieved by allowing the stream to develop a stable dimension, pattern (meander geometry), and profile such that, over time, channel features are maintained and the stream system neither aggrades nor degrades. However, a stable dynamic stream may migrate laterally while maintaining dimension, pattern, and profile (Rosgen 1996). Lateral migration will allow for new and dynamic habitat formation. Floodplain functions and habitat forming processes must be allowed to take place over time with minimal intervention by the WSDOT, except what is necessary to ensure that the goals, objectives, and functions of the created stream channels are met. Protection of the highway infrastructure should only be contemplated when it is in imminent danger and only then using non-invasive and environmentally -friendly protective measures, such as those presented in the Integrated Streambank Protection Guidelines (Cramer et al. 2003).

Although recent sampling is limited and there are uncertainties regarding the concentration of arsenic, as well as the impact of mixtures with other potential contaminants, there is a definite risk to listed PS steelhead and other resources that will use the relocated Hylebos Creek and Surprise Lake Drain. Arsenic and copper concentrations measured between 2002 and 2006 indicate that there is the potential for significant impacts to PS steelhead, particularly those rearing or migrating in the relocated waterbodies, if elevated groundwater from the landfill migrates to the new channels (Beckvar, NOS, pers. comm. 2006). Again, juvenile steelhead in the relocated creek would have additional arsenic exposure via the food web because arsenic may impact salmonid prey due to growth inhibition of algae measured at lower arsenic concentrations than are toxic to fish.

Juvenile steelhead rearing in the relocated waterbodies may also experience additional exposure to arsenic when they reach the Hylebos waterway, where concentrations in water and sediment are still elevated. The effect of this additional exposure is unknown. The presence of other metals in water, sediment and the food web, particularly dissolved copper and zinc from stormwater, could combine with the arsenic to cause negative effects at lower arsenic concentrations.

### **Effects of the Proposed Action**

“Effects of the action” means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. It should be noted that the proposed project includes the indirect effects by hauling 3.7 million cubic yards of roadbed fill from up to 50 aggregate sources in Pierce and King Counties.

This section addresses those project elements the NMFS determined were likely to adversely affect steelhead.

#### *Project Schedule*

Construction of the project is expected to occur in multiple phases over a 13-year period. Temporary and permanent removal of vegetation is expected to take two years per subbasin followed by stabilization for an additional year. Placement of fill is expected to take two years per sub-basin followed by vegetative stabilization for an additional year. Construction of the RRP will occur over several years in order to accommodate the timing of various phases of the project. Construction of the Hylebos Creek RRP is expected to take two construction seasons and one year for the Surprise Lake Drain RRP. Vegetation establishment is expected to take up to ten years. Mitigation site creation is expected to take one construction season per selected site, and vegetation establishment may take up to ten years. In-water work required for many of the bridges and culverts, stream diversions and relocations is expected to take place between July 15 and August 31. Thus, construction activities occurring within the OHWM when steelhead are present may disrupt the fish during foraging and migration.

### *Turbidity*

The area of impact is defined by water quality mixing zones not to exceed 300 feet in Puyallup River. Steelhead occurring within the mixing zone will be subjected to elevated turbidity and are expected to experience avoidance behavior, gill abrasion, and coughing.

### *Pile Driving*

The original project intended to install up to 150 hollow steel piles to support two work trestles and a detour bridge. These structures have been reduced to a partial work trestle with up to 60 piles. At least half of these will be above the wetted channel or in water less than three feet deep. An underwater noise attenuation device will be used on those piles located in water three feet or deeper during impact proofing and is expected to achieve a minimum reduction of 10 decibels. Steelhead of all sizes that occur within 823 feet of the impact pile driving may be injured and those within 1,850 feet upstream and 4,200 feet downstream of the bridge site may be disturbed by the underwater noise.

Adverse effects on survival and fitness of exposed PS steelhead can occur even in the absence of overt injury. Exposure to elevated noise levels can cause a temporary shift in hearing sensitivity (referred to as a temporary threshold shift), decreasing sensory capability for periods lasting from hours to days (Turnpenny et al. 1994; Hastings et al. 1996). Popper et al. (2005) found temporary threshold shifts in hearing sensitivity after exposure to cumulative SELs as low as 184 dB. Temporary threshold shifts reduce the survival, growth, and reproduction of the affected steelhead by increasing the risk of predation and reducing foraging or spawning success.

### *Water Crossing Structures*

The project entails construction, widening, removal, or replacement of 56 temporary and permanent bridges and culverts: 26 crossing Hylebos Creek, one crossing the Fife Ditch, 11 crossing Surprise Lake Drain, 14 crossing Wapato Creek, and five crossing the Puyallup River. These are described in greater detail in Appendix II and III of the original Opinion. The same outcome and potential impacts from replacing these structures that are expected for Chinook salmon are also applicable to steelhead. Prior to constructing these sites, the fish will be excluded and the stream will be dewatered. Post-construction, the natural channel-forming processes, floodplain functions, and habitat connectivity will develop and are expected to improve the habitat functions for all life stages of steelhead.

### *Stormwater*

As identified in the original opinion, the proposed SR 167 extension project will result in a net increase of 204 acres of new PGIS. Stormwater runoff from 245 acres of new and existing PGIS will be treated.

Within the mixing zone at the end of the stormwater discharge pipe, steelhead may be exposed to elevated levels of dissolved zinc and copper and polycyclic aromatic hydrocarbons. These

contaminants can be ingested and may make juveniles incapable of using predator avoidance behavior by impairing olfactory senses. Adult steelhead may briefly pass near the mixing zone but are not expected to linger long enough to ingest harmful quantities. Adult and juvenile steelhead tend to stay mid-channel and will likely avoid the nearshore mixing zone located at edge of the channel in the Puyallup River and tributaries within the project footprint.

The FHWA and WSDOT have committed that stormwater runoff that cannot be infiltrated will receive flow control and enhanced treatment for pollutants. If sites are determined to be unsuitable for infiltration or enhanced treatment, these areas will be analyzed for their pollutant loads and dissolved zinc and copper concentrations. This information, along with a treatment plan, will be provided to the NMFS for approval a minimum of 90 days before construction begins. If the analysis predicts potential exceedences of dissolved copper and dissolved zinc concentrations, and then leads to the NMFS disapproval of the revised treatment, reinitiation of consultation is required as identified in the original Opinion Term and Condition 3.g. (page 98).

### *Riparian Restoration*

Invasive plants will be mechanically removed or controlled using Glyphosate. This chemical can be toxic to fish; therefore, it will be judiciously applied to individual stems rather than broadcast spread to avoid overspray into streams. The proposed project includes restoring and preserving approximately 218 acres of riparian and wetland habitat, creating forested buffers along 4.4 miles of streams, and enhancing 63 acres of existing wetlands. The restoration and creation will improve water quality, provide natural shade and organic detritus, and cover for all life stages of steelhead.

### *Fish Handling*

The new bridge pier located below the OHWM of the Puyallup River will be constructed within a caisson enclosure structure that doubles to allow working in the dry and isolates the work from fish-bearing water. The caisson resembles a large diameter tube that is vibrated into the substrate and the water is pumped out. Juvenile steelhead trapped within will be removed with dip nets as the water level lowers. Handling juvenile steelhead may be necessary when dewatering sections of Hylebos Creek, Surprise Lake Drain, Fife Ditch, and Wapato Creek. All fish exclusion will follow the WSDOT stream dewatering and fish handling protocol. The general response of fish that are trapped and removed is a period of high stress levels which dissipate after they are released, indicating that the injury is temporary. Electro-shocking may be used as a last resort to clear out fish. Up to two percent of shocked fish may die from injuries.

### *Bridge Shading*

The new SR 167 Bridge over the Puyallup River will increase shading of the channel by approximately 3,000 square feet. The shaded area covers a portion of the channel with limited habitat features. The streambed under the proposed bridge location is primarily composed of silt, fines, and gravel and devoid of structure and holding pockets that would attract predatory species to prey on juvenile steelhead. Thus, shading from this project is not expected to increase the risk of predation on juvenile steelhead.



### *Substrate*

Approximately 60, 24-inch hollow steel piles will be used to support the work trestle for constructing the new SR 167 Bridge. The piles will occupy 188 square feet of the Puyallup River bed during one season. This area of the channel provides limited foraging and holding habitat for steelhead; thus, the piles are not expected appreciably reduce the quality and quantity of available habitat.

### *Channel Restoration*

Degraded portions of the Hylebos Creek and Surprise Lake Drain within the project footprint or adjacent to I-5 will be relocated. The new channels include restoring and meandering up to 4,000 linear feet in Hylebos Creek and 5,300 linear feet in Surprise Lake Drain. In the SR 167 and I-5 interchange, a portion of the Hylebos Creek will be diverted into an open channel for up to three years while the interchange and new channel are constructed. Fish passage will be maintained in the diversion channel for the duration of construction until the new channel is established. The restoration will provide channel forming processes, floodplain functions, and habitat connectivity; thus, improving habitat for rearing juvenile steelhead.

### **Amount or Extent of Take**

Individual juvenile and adult PS steelhead use the action area for migration and/or rearing and are therefore likely to be present in the action area when adverse effects from the construction and operation of the proposed SR 167 Extension. Because these effects will injure or kill individuals of the PS steelhead DPS or adversely affect their habitat, take is certain to occur.

Incidental take caused by the adverse effects of the proposed action will include the following:

- (1) the displacement of juvenile or adult steelhead from their preferred habitat due to the loss of benthic invertebrate prey production from increased turbidity or sedimentation from upland construction or in-water work in the Puyallup River;
- (2) habitat avoidance, reduced growth or reproductive rates, and/or mortality in juvenile steelhead from the application of Glyphosate for the control of invasive plant species;
- (3) temporal loss of riparian and in-stream steelhead habitat from implementation of the RRP, construction of RRP crossing structures, and stream diversions and relocations;
- (4) delayed out-migration, inhibited smoltification, or death of juvenile steelhead rearing in relocated Hylebos Creek or Surprise Lake Drain from arsenic and copper in the areas of the proposed Hylebos subbasin RRP;
- (5) migratory or rearing behavior modification, injury, or death of juvenile or adult steelhead from elevated sound pressure levels associated with impact pile driving;

(6) elimination of habitat for the production of juvenile fish invertebrate prey from the temporary and permanent placement of in-water structures;

(7) injury or death of juvenile or adult steelhead from work area isolation or fish handling;

(8) olfactory inhibition or migratory or rearing behavior modification of juvenile or adult steelhead from stormwater BMP effluent concentrations of dissolved copper exceeding the olfactory inhibition effects threshold or dissolved zinc exceeding the behavioral effects threshold;

(9) reduction in subsurface water exchange with the Puyallup River;

Incidental take within the action area that meets the terms and conditions of this incidental take statement and is within the statutory authority of the FHWA will be exempt from the take prohibition. The NMFS anticipates that up to two juvenile or adult PS steelhead will be injured or killed due to work necessary to isolate the in-water construction areas in the Puyallup River. This estimate is based on the low probability of steelhead being present during the in-water work, but also accommodating the possibility of encountering them when enclosing the portion of the river to build the bridge pier.

Take caused by the habitat-related effects of this action cannot be accurately quantified as a number of fish because the relationship between habitat conditions and the distribution and abundance of those individuals in the action area is imprecise. In-water and riparian areas damaged by turbidity and sediment, application of Glyphosate, elevated sound pressure levels, as well as areas occupied by pilings and cofferdams are expected to recover characteristics that are favorable for rearing and migration after the project is completed. Temporary habitat impacts to in-water and riparian areas will exist from the construction of the RRP, crossing structures, stream relocation, and wetland mitigation sites until habitat functions are restored. Areas that will be filled by the columns and drilled shaft will not recover invertebrate prey production during the life of the project, but may provide other significant conservation value, such as holding or resting habitat.

The indirect effects of stormwater or other contaminants exceeding the effects thresholds in the relocated Hylebos Creek, Surprise Lake Drain, and the Hylebos subbasin RRP, and the increased PGIS will harm individuals for the life of the project - a type of take that can be more deleterious than the direct loss of individuals during the construction phase. In such circumstances, the NMFS uses the causal link established between the activity and a change in habitat conditions affecting the listed species to describe the extent of take as a quantifiable level of habitat disturbance.

Take is exempted for:

1. the area of temporary water quality degradation, not to exceed five Nephelometric Turbidity Units above background levels for no more than three days, within 300 feet of in-water construction activities in the Puyallup River, and within 100 feet of in-water construction activities in Surprise Lake Drain and Hylebos Creek, or within 200 feet of

in-water construction activities in Hylebos Creek if significant rainfall during the in-water work window results in discharges in excess of 10 cfs;

2. impact pile installation without sound attenuation only as necessary to determine baseline SPLs and only as specified in the hydroacoustic monitoring plan;
3. the area of SPLs:
  - a. in excess of 180 dB<sub>peak</sub> due to impact pile proofing with approved sound attenuation where physical injury or death of listed fish can be expected to occur; up to 144 feet of the estimated 210-foot wetted width of the Puyallup River up to 72 feet up- or downstream of the pile driver;
  - b. in excess of 150 dB<sub>rms</sub> due to impact pile proofing with approved sound attenuation where behavioral modification of listed fish can be expected to occur; the entire estimated 210-foot wetted width of the Puyallup River up to 1,500 feet upstream and 2,300 feet downstream of the pile driver;
4. the 3,000 square feet of shading and 188 square feet of streambed habitat affected by the placement of the temporary work trestle and the 100 square feet of in-water habitat eliminated by the placement of permanent drilled shaft pier structures;
5. stormwater discharges in Hylebos Creek only when the concentration of dissolved copper does not exceed 4.06 µg/L and the concentration of dissolved zinc does not exceed 37.68 µg/L immediately outside the mixing zones (300 feet long downstream by 25 percent of the stream width during the seven day average low flow that has a 10 percent chance of occurring in any given year);
6. stormwater discharges in the Puyallup River only when concentrations of dissolved copper do not exceed 2.3 µg/L over background levels not exceeding 3.0 µg/L and concentrations of dissolved zinc do not exceed 5.6 µg/L over background levels between 3.0 µg/L and 13.0 µg/L at a distance no greater than 1.5 feet from the WSDOT stormwater outfall.

The estimated number of fish entrained during work area isolation, the extent of in-water and riparian habitats that will be harmed by construction, the area of elevated SPLs from impact pile driving, and stormwater BMP effluent concentrations exceeding effects thresholds at identified distances from the stormwater outfalls are thresholds for reinitiating consultation. Exceeding any of these limits will trigger the reinitiation provisions of this Opinion.

While the listing of PS steelhead and changes to the proposed design cause changes in the amount and extent of take, they do not change the NMFS' opinion that the proposed action is not likely to jeopardize the continued existence of PS Chinook salmon and PS steelhead or destroy or adversely modify PS Chinook salmon designated critical habitat. Additionally, the changes to

the bridge design are expected to reduce impacts to the Essential Fish Habitat for Chinook salmon, coho salmon, and pink salmon.

### **Reasonable and Prudent Measures**

Reasonable and prudent measures (RPMs) are nondiscretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in Section 7(o) (2) to apply. The FHWA has the continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of Section 7(o)(2) will lapse if the FHWA fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. Similarly, if any applicant fails to act in accordance with the terms and conditions of the incidental take statement, protective coverage will lapse.

The NMFS believes that full application of minimization measures included as part of the proposed action, together with use of the reasonable and prudent measures and terms and conditions described below, are necessary and appropriate to minimize the likelihood of incidental take of listed species due to completion of the proposed action. The NMFS believes the RPMs from the original Opinion, as described below, are applicable to avoid and minimize impacts to PS steelhead. The Terms and Conditions associated with each of the RPMs are equally appropriate for PS steelhead and are incorporated by reference from page 94 – page 99 of the original Opinion.

The FHWA shall:

1. Minimize incidental take from riparian and in-water work;
2. Minimize incidental take from elevated Sound Pressure Levels (SPLs) due to impact pile installation and/or proofing;
3. Minimize incidental take from water quantity, water quality, and sediment quality degradation; and
4. Ensure completion of a monitoring and reporting program to confirm that the Terms and Conditions in this Incidental Take Statement are effective in avoiding and minimizing incidental take from permitted activities.

NOTICE: If a sick, injured or dead specimen of a threatened or endangered species is found in the project area, the finder must notify NMFS through the contact person identified in the transmittal letter for this Opinion, or through the NMFS Office of Law Enforcement at (800) 853-1964, and follow any instructions. If the proposed action may worsen the fish's condition before NMFS can be contacted, the finder should attempt to move the fish to a suitable location near the capture site while keeping the fish in the water and reducing its stress as much as possible. Do not disturb the fish after it has been moved. If the fish is dead, or dies while being captured or moved, report the following information: (1) NMFS consultation number; (2) the date, time, and location of discovery; (3) a brief description of circumstances and any information that may show the cause of death; and (4) photographs of the fish and where it was

found. NMFS also suggests that the finder coordinate with local biologists to recover any tags or other relevant research information. If the specimen is not needed by local biologists for tag recovery or by NMFS for analysis, the specimen should be returned to the water in which it was found, or otherwise discarded.

NOTICE: To follow inactive projects and, if necessary, withdraw the opinion for an incomplete project, the FHWA shall provide an annual report even if no actual work was completed in a particular year.

## **Conclusion**

The change of the bridge construction design and location is expected to reduce short- and long-term impacts on PS Chinook salmon and their critical habitats from that which was already considered in the original Opinion. These changes include reducing the number and duration of in-water piles, area of temporary shading as well as temporary and permanent streambed impacts, and the extent of underwater noise disturbance.

Pile driving, fish exclusion, and stream diversions are expected to temporarily impact steelhead in the lower Puyallup River and its tributaries. However, these actions are timed to avoid nearly all migrating adults and juveniles. Stormwater treatment facilities have not been designed yet; however, all stormwater runoff within the project footprint will be infiltrated where practicable. Where this isn't possible, stormwater will receive enhanced treatment and flow control using the most effective treatment design to prevent pollutants from entering streams in the lower Puyallup River basin.

If you have questions regarding this consultation, please contact Michael Grady of the Washington State Habitat Office at (206) 526-4645, or by electronic mail at [Michael.Grady@noaa.gov](mailto:Michael.Grady@noaa.gov).

Sincerely,



William W. Stelle, Jr.  
Regional Administrator



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U.S. Department  
of Transportation  
  
**Federal Highway  
Administration**

Washington Division

Suite 501 Evergreen Plaza  
711 South Capitol Way  
Olympia, Washington 98501-1284  
(360) 753-9480  
(360) 753-9889 (FAX)  
<http://www.fhwa.dot.gov/wadiv>

July 25, 2012

HFO-WA.4/WA 34

Mr. Ken Berg  
U.S. Fish and Wildlife Service  
510 Desmond Drive SE, Suite 102  
Lacey, WA 98503

**SR 167 Extension  
ESA Section 7 Formal Update  
USFWS Reference No. 1-3-05-F-0688  
Federal Aid No. BR-0167 (047)**

Dear Mr. Berg:

The Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT) have recently updated information for the State Route (SR) 167 extension project. The first phase of the project is scheduled for advertisement in 2013, and will include the replacement of the SR 161 Bridge over the Puyallup River.

Recent design work has resulted in project changes that differ from the description in the original biological assessment (BA). This letter documents those changes. Although the changes to the project will still result in a **may affect, likely to adversely affect** determination for bull trout, the extent and duration of in-water effects on bull trout have been reduced. The changes to the project description that we discuss here are for your records and we are not requesting reinitiation at this time. We are reinitiating our consultation with the National Marine Fisheries Service (NMFS) and are adding two species that were not listed at the time of the original consultation, Puget Sound steelhead and Pacific eulachon.

FHWA and WSDOT submitted a BA for the extension of SR 167 on September 27, 2005 to the U.S. Fish and Wildlife Service (USFWS) and the NMFS. The extension consists of a new six-lane freeway between SR 161 and SR 509 in Pierce County, Washington. Associated project elements included numerous water crossings (including an improved crossing of SR 161 over the Puyallup River), interchanges, and riparian restoration throughout the project area.

The Services requested additional project information after the original BA submittal, which was transmitted to the Services on December 15, 2005. There were several additional information/clarification requests from the Services on stormwater, indirect effects, minimization measures, exposure pathways, and other issues prior to the issuance of the Biological Opinions

(BOs). The BA concluded that project impacts would adversely affect the Coastal-Puget Sound bull trout DPS. Critical habitat for Puget Sound Chinook was designated September 2, 2005 and for bull trout on September 26, 2005, after the BA was submitted. Subsequent analyses determined that the project would adversely affect critical habitat for bull trout.

The USFWS and NMFS BOs were issued on May 31, 2007, and August 20, 2007, respectively (USFWS Ref. No. 1-3-05-F-0688, NMFS Tracking No. 2005/05617). The Services concluded that project actions would not jeopardize the continued existence of these listed species and would not cause adverse modification or destruction of the designated critical habitats in the action area.

FHWA and WSDOT are updating project information because of changes to the project description and related potential impacts to listed species. These changes were discussed with the Services in a pre-BA meeting on November 17, 2011, at WSDOT Headquarters in Olympia, WA. There has been no construction on the project to date, but the majority of the right-of-way has been purchased.

WSDOT plans on advertising for the first segment of the project in May 2013. This segment will only include work on two SR 161 bridges over the Puyallup River and associated road approaches. In the original project description, the existing two-lane steel bridge was to ultimately be replaced with a five-lane structure. In this phase of the work, the deteriorating two-lane steel bridge will be replaced with a new two-lane bridge, and additional lanes added utilizing the footprint of the two existing bridges at a later date. This work phase will not include changes to work elements in the Hylebos Creek, Surprise Lake Tributary, or Wapato Creek portions of the action area. WSDOT intends to build this project phase using the design-build process.

### **Changes to Project Description**

There are currently two adjacent SR 161 bridges that cross the Puyallup River within the action area; the northbound structure is a clear-span bridge, has two lanes, is made of steel, and is deteriorating rapidly (dimensions 370' long, with wooden approach structures 100' long on either end, steel truss 22' wide, 40' above ordinary high water {OHM}). The southbound structure is 2 lanes and is made of concrete (dimensions 541' long, 36' wide, and 40' above OHM). In the original project description, the steel bridge was to be replaced and the concrete bridge widened. To accomplish the bridge replacement and widening, two temporary work trestles and one temporary detour bridge were proposed. A barge would likely have been needed as a work platform for up to two construction seasons.

In the original consultation, the new bridge was to be located utilizing an expanded footprint of the existing steel bridge. It was anticipated that building two temporary work trestles and a temporary vehicular detour bridge would take 2 years of construction time, given the proposed 6-week in-water work windows (July 15-August 31). The entire construction period would likely have taken several years.

WSDOT is now proposing to put a new bridge 10' downstream of the existing concrete bridge instead of where the existing steel bridge is located. The new bridge will be 541' long, 40' wide, and at least 40' above OHM, and the bridge location, design, and construction method will



change. By relocating the new structure, work can be done on the new bridge by staging equipment on the existing concrete bridge. This will reduce the extent of the temporary in-water work trestles that are needed to construct the new bridge (less pile driving), and reduce noise impacts to listed aquatic species. This will also reduce impacts to businesses on the north side of the river. The new bridge will require an in-water pier and a temporary work trestle will be needed for that pier work. The temporary trestle for the pier will be much smaller than the temporary trestle originally planned adjacent to the entire length of the steel bridge. Although the specific area and number of piles needed for this temporary trestle are unknown at this stage, it is anticipated that there will be a significant decrease in the over-water trestle area, a decrease in trestle time in-place in the Puyallup River, and a decrease in the number of piles needed for the pier trestle compared to the original plan. The approximate dimensions of the temporary trestle are 30' wide by 100' long, as opposed to a 30' wide trestle the full 300' width of the river. Due to the configuration of the proposed new bridge, the need for a detour bridge has been eliminated. To complete the work at some future time, a new five lane structure will be constructed utilizing the foot print of the two existing SR 161 Puyallup River crossings.

Interim work that will be done on the concrete bridge includes removing the existing sidewalk and upgrading the traffic barrier on either side of the bridge deck. No work will be done on the piers of this bridge in this phase of work.

The project will be built with the design/build process, and WSDOT would specify the location of bridge piers, bridge length/width, and touch-down points. Constructability issues would be left to the contractor within the constraints of the consultation.

An additional issue emerged after the project Environmental Assessment (EA) was completed. The existing steel bridge was not considered a historic structure in that analysis. A Section 106 analysis was recently conducted, and the State Historic Preservation Office (SHPO) determined that the steel truss bridge is historic. This bridge will remain in place until a suitable location is found for it, either interim or permanent. The existing steel bridge cannot remain in-place for the full project build-out. During that interim period it will, at a minimum, be closed to traffic and pedestrians and would not be considered a pollution generating impervious surface. Eventual bridge removal will follow the procedures outlined in the original BA. Removal may occur as a part of this bridge replacement phase; negotiations with the SHPO are on-going.

Another question was raised in the pre-BA meeting regarding the original stormwater analysis for the SR 161 bridge area. The question was asked if the stormwater analysis had been updated for the bridge area. Potential effects from stormwater were originally analyzed using a precursor to the currently used Hi-Run model. The original analysis was conducted for the Puyallup River drainage basin, and the bridge area was a small part of the larger basin.

Additional design work on stormwater best management practices (BMPs) is in progress, and staff will be conducting a stormwater analysis as plans develop. Preliminary plans show placement of a bioinfiltration swale within the northwest bridge quadrant; this was not in the original BA plans. The two bridge outfalls will also be relocated, with no additional outfalls being constructed. Final plans will be developed by the design-build contractor, and will meet or exceed the design standards specified in the BOs, including the use of enhanced BMPs for this area. WSDOT staff will conduct an updated stormwater analysis once these plans are available.

Changes to the project description are summarized in Table 1 below.

**Table 1. Comparison of Original and Revised Project Description Elements at the Puyallup River, SR 167, Pierce County, WA**

<b>Work Element</b>	<b>Original BA 2005</b>	<b>Revised BA 2012</b>
New bridge location	Replace bridge within footprint of existing steel structure	Replace bridge 10' downstream of concrete bridge
New bridge construction	Maximum of 2 in-water piers, drilled shafts	1 in-water pier, drilled shafts
Existing steel bridge historical status	Not historic	Recent SHPO concurrence that steel truss bridge is historic
Existing concrete bridge work	Widen bridge from 33 to 43 feet	No widening in this phase but remove sidewalk and upgrade traffic barriers
SR 161/167 intersection	Change to full interchange	No change
Temporary structures within OHWM	3 structures: 1 trestle for work on steel bridge (maximum of 100 piles), 1 trestle for work on concrete bridge (maximum 100 piles), 1 detour bridge (maximum 100 piles)	Final design based on design build contractor, but 1 temporary trestle for steel bridge pier reduced in area and duration in-water from initial plan, and temporary detour bridge eliminated. Potential reduction of estimated 100-150 in-water piles.
Pollution generating impervious surface	About 70 acres in Puyallup basin	Unchanged
Stormwater treatment	Impacts assessed at basin level. Basic and enhanced treatment to meet performance standards for total and dissolved copper, total and dissolved zinc, suspended sediment	Bioinfiltration swale proposed for NW quadrant of bridge. Stormwater analysis will be conducted once final plans are available.

### **Potential New Effects to Species From Changes in the Project Description**

In the original consultation and subsequent updates, bull trout were found to be adversely affected by proposed project actions, as well as their critical habitat. Bull trout are found in the Puyallup River and may use the mouth of Hylebos Creek. The project changes described here only affect the Puyallup River.

Primary effects to bull trout were originally described as follows:

- Increased sedimentation and turbidity up to 300 feet downstream of in-water work;
- Increased impervious surface will degrade bull trout foraging, overwintering and migrating habitat;
- Project activities will negatively affect hydrologic functions in the lower Puyallup River;
- Underwater noise from pile driving up to 0.6 mile upstream and downstream;
- Stormwater discharges to the Puyallup River after treatment; and
- Dewatering and fish handling.

The revised project will still have the same effects, but some of the effects (underwater noise, turbidity, and shading) will be reduced in magnitude for the Puyallup River portion of the action area. Although the specific construction methods will not be known until final plans are available from the design-build contractor, it is anticipated that the number of piles for temporary structures in the Puyallup River may be reduced by  $\frac{1}{3}$  to  $\frac{1}{2}$  from the original estimate of 300 piles. This will lead to reduced sound exposure levels for listed bull trout, fewer days with in-water pile driving and less associated turbidity, less shaded area in the river, a smaller area of impact to benthic prey organisms, and a reduced in-river area for temporary structures that may affect salmonid migration.

The original determination indicated that the proposed project **may affect, and is likely to adversely affect** bull trout. This determination was based on:

- migrating anadromous bull trout potentially occur in the Puyallup River throughout the year and fish handling may be necessary; and
- in-water work including pile driving and potential dewatering is proposed in the Puyallup River that may result in harm and behavioral disruption to the species.

The revised project with construction of a new SR 161 bridge over the Puyallup River **may affect, and is likely to adversely affect** bull trout, but the effects of underwater noise, turbidity, and shading from temporary in-water structures are expected to be diminished from original estimates because fewer and smaller in-water structures are anticipated.

### **Bull Trout Critical Habitat**

In the original BA, it was concluded that the project **will not result in the destruction or adverse modification** of bull trout proposed critical habitat. The USFWS designated bull trout critical habitat in 2005 and then made a final revision in 2010. Definitions of the primary constituent elements (PCEs) were changed and a new ninth PCE was added in the final 2010 designation. The 2010 revision excluded from critical habitat the area on the Puyallup River within Puyallup Tribal lands. Final critical habitat within the action area is found from approximately river-mile 7.2 to 10.1; this includes the SR 161 Bridge over the Puyallup River. The Puyallup Project actions covered in the original BA and the project changes that are mentioned here were used to analyze effects to bull trout PCEs.

The revised project with construction of a new SR 161 bridge over the Puyallup River **may affect, and is likely to adversely affect** bull trout critical habitat, with an analysis of effects to each PCE below.

**PCE 1:** Springs, seeps, groundwater sources, and subsurface water connectivity.

There will be adverse effects to this PCE from grading, filling, and new impervious surface, which will reduce soil infiltration, reduce groundwater recharge and reduce subsurface water exchange.

**PCE 2:** Migration habitats with minimal impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats.

Bull trout use the action area primarily as a migration corridor. Although bull trout will be able to continue to migrate through the action area during and after the project, potential project effects could lead to slight increases in water temperature and temporary, localized turbidity. There will be a new, permanent, in-water pier for the new bridge and associated temporary in-water structures. Collectively, these could alter migration timing or cause bull trout to avoid active work areas in the Puyallup River.

**PCE 3:** An abundant food base.

Adult anadromous bull trout are migrating through this area and would primarily feed on other fish, including migrating juvenile salmonids. Juvenile salmonids could be affected by temporary turbidity from installation of temporary structures and a new bridge pier in the Puyallup River, as well as by increases in water temperature. Benthic organisms will also be affected by temporary structure footprint and the small, permanent pier footprint. All of these effects are considered insignificant because of the very small or temporary changes that are expected.

**PCE 4:** Complex river, stream, lake, reservoir, and marine shoreline aquatic environments with features such as large wood, side channels, pools, undercut banks and unembedded substrates.

All of the aquatic habitats in the action area are not properly functioning. The original design had a maximum of three in-water piers for two Puyallup River bridges (1 existing pier and 2 new piers), and the number of piers will likely be reduced. New piers and temporary work structures will have insignificant effects on complex habitat elements. There may be beneficial effects to complex habitat features from riparian and wetland restoration actions.

**PCE 5:** Water temperatures ranging from 36°F to 59°F with adequate refugia available for temperatures at the upper end of the range.

Water temperature in the lower Puyallup River is at the upper end of the range that bull trout can tolerate. Vegetation removal may directly elevate surface water temperature and grading/filling can indirectly affect surface water by changing groundwater flow and subsurface recharge. Although these effects may lead to increases in surface water temperature, potential riparian restoration along the Puyallup River may have beneficial effects once trees mature and can provide streambank shade.

**PCE 6:** Substrate of sufficient size, amount, and composition, to ensure egg, fry, young of the year, and juvenile survival.

There is no bull trout spawning habitat in the action area, including that portion of the action area within designated critical habitat. There will be no effect on spawning substrate.

**PCE 7:** A natural hydrograph with peak, high, low, and base flows within the historic range.

The Puyallup River continues to experience flows below the minimum standard of 1000 cubic feet per second. Peak flows have increased, probably associated with increased impervious surface in the watershed. The current conditions on the lower Puyallup represent departures from the historical conditions. Runoff from new impervious surface associated with this portion

of the project (about 70 acres) will be collected through three outfalls, two of which will discharge into the Puyallup River via the Oxbow Ditch system and one directly into the river. Enhanced treatment Best Management Practices (BMPs) are estimated to infiltrate approximately 92 percent of the runoff. Despite the proposed BMPs, peak flows may be elevated by increased impervious surface in this basin. Potential wetland mitigation may improve floodplain connectivity and attenuate peak flows.

**PCE 8:** Permanent water having sufficient quantity and quality such that normal reproduction, growth, and survival are not inhibited.

The Puyallup River is a perennial stream with an impaired 303(d) status for high fecal coliform bacteria levels, elevated mercury levels, and low flows. It primarily serves as a migratory corridor for bull trout. Runoff from new impervious surface associated with the project will be treated, but will further degrade water quality, adversely affecting this PCE.

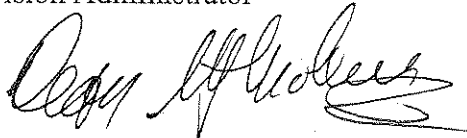
**PCE 9:** Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

There will be no project actions that include introduction of non-native predatory, interbreeding, or competing fish species. There will be no project actions that might affect or create migratory pathways between populations of these fish and bull trout in the Puyallup River. There will be no effect to this PCE.

There are no additional project updates at this time, but we will keep the Services informed as developments arise. If you have any questions or require additional information, please contact me at 360-534-9344 or by e-mail at [Dean.Moberg@dot.gov](mailto:Dean.Moberg@dot.gov).

Sincerely,

DANIEL M. MATHIS, P.E.  
Division Administrator

A handwritten signature in black ink, appearing to read 'Dean W. Moberg', with a stylized flourish at the end.

By: Dean W. Moberg  
Area Engineer

cc: C. Ward, OR EHS  
B. Clarke, OR Project Engineer  
M. Carey, HQ ESO

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